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| APPLICATION NO.  | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO.               | CONFIRMATION NO.       |
|--|-------------|----------------------|-----------------------------------|------------------------|
| 10/590,875   | 08/28/2006  | Laurent Allidieres   | Serie 6500                        | 2921                   |
| 40582  | 7590        | 10/03/2008           |                                   |                        |
| AIR LIQUIDE<br>Intellectual Property<br>2700 POST OAK BOULEVARD, SUITE 1800<br>HOUSTON, TX 77056 |             |                      | EXAMINER<br>BOBISH, CHRISTOPHER S |                        |
|  |             |                      | ART UNIT<br>3746                  | PAPER NUMBER           |
|  |             |                      | MAIL DATE<br>10/03/2008           | DELIVERY MODE<br>PAPER |

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

# Office Action Summary

**Application No.**

10/590,875

**Applicant(s)**

ALLIDIERES, LAURENT

**Examiner**

CHRISTOPHER BOBISH

**Art Unit**

3746

**Period for Reply** -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 28 August 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) 1-10 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 11-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 August 2006 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-85/86)
- Paper No(s)/Mail Date 08/28/2006
- 4) ☐ Interview Summary (PTO-413)
- Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Individual Patent Application
- 6) ☒ Other: Translation of EP0010464

## DETAILED ACTION

### *Specification*

Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, **such as "means" and "said," should be avoided**. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

### *Drawings*

The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: **Page 5 Line 16 recites "depressurization valve 7a", there is no 7a shown in the drawings**. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37

CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 11-20 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 11, line 3, recites "wherein *it* comprises means", it is unclear as to which feature of the invention "it" refers.

Claim 16 recites the limitation "said tanks" in line 1. There is insufficient antecedent basis for this limitation in the claim.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 11, 16, 17, 19 and 20 are rejected under 35 U.S.C. 102(b) as being anticipated by Hughes et al (US PGPUB No. 2002/0083719 A1).

Hughes teaches:

limitations from claim 11, a cryogenic fluid, **Page 1 ¶ 3 (LPG)**, pumping system, **FIG. 1 (100) Page 2 ¶ 16**, comprising at least one cryogenic fluid tank, **FIG. 1 (104) Page 2 ¶ 16**, a cryogenic pump, **FIG. 1 (114) Page 2 ¶ 18**, having an inlet pressure drop (NPSH) and a suction line, **FIG. 1 (122) Page 2 ¶ 18-19**, connecting said tank (104) to said pump (114), wherein it comprises means for controlling the pressure in the suction line comprising control means for pressurizing, **FIG. 1 (124, 123, 134) Page 2 ¶ 22-24**, Hughes teaches **pressurizing the tank (104) by circulating vapor from a heat exchanger into the tank to keep the pressure in the tank sufficiently high for preventing cavitation**, and depressurizing the tank, **FIG. 1 (114, 120, 122) Page 2 ¶ 19**, the pump (114) pumps liquid from the tank (104) through valve (120), thereby **lowering the pressure of the tank**, for maintaining the pressure in the suction line at most as high as the cryogenic fluid saturation pressure plus the inlet pressure drop (NPSH) of the cryogenic pump, **Page 1 ¶ 5 and 9**, **by keeping the tank (104) pressure at a desired level, the system will also keep the suction line (~122) at a desired level to avoid cavitation caused by NPSH;**

limitations from claim 16, the pumping system (100) of claim 11, wherein said tank (104) is filled with saturated cryogenic fluid, **FIG. 1 (106)**, with its vapor, **FIG. 1 (108) Page 2 ¶ 16;**

limitations from claim 17, the pumping system (100) of claim 11, wherein said cryogenic fluid (106) is a low density fluid, **FIG. 1 (100) Page 1 ¶ 3**, LPG's are known to be low density;

limitations from claim 19, the pumping system (100) of claim 11, wherein the tank (104) is pressurized using a pressurized gas source, **Page 2 ¶ 22-23;**

limitations from claim 20, the pumping system (100) of claim 19, wherein the pressurizing gas of the pressurized gas source is part of the fluid pressurized by the pump (114); **Page 2 ¶ 24**, the pump (114) supplies pressurized fluid to valve (120) which allows a portion of the fluid to pass through a heat exchanger (124) to pressurize tank (104).

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hughes et al (US PG PUB No. 2002/0083719 A1) in view of Brigham (US Patent No. 4,662,181).

Hughes teaches and discloses of the fluid pumping system in claim 1.

Hughes further teaches:

From claim 12:

a control means comprising a pressure sensor and a temperature sensor, **FIG. 1 (36) Page 1 ¶ 10 and Page 2 ¶ 25**, for respectively determining the pressure and temperature of the cryogenic fluid, **Page 1 ¶ 10 suggests that any suitable combination of sensors, including pressure and temperature sensors, can be used to measure the fluid, supplying signals to a control unit, FIG. 1 (132) Page 2 ¶ 25**, for controlling said pressurization means (124, 123, 134), **Page 2 ¶ 25 teaches the controller (134) adjusting the flow of fluid into heat exchanger (124), which then pressurizes a tank (104);**

**Hughes teaches that the sensors (36) are located inside of the tank (104) rather than in a suction line (~22), however it would have been obvious to one having ordinary skill in the art of pumps to change the location of the sensors to the suction line to meet design constraints, as the pressure in the tank would be closely related to the suction line pressure.**

While Hughes teaches a controller for a pressurization means (134), Hughes does not teach that a depressurization means (114, 120, 122) is also controlled, but Brigham does.

Brigham teaches:

From claim 12:

a controller (112) receiving signals from a sensor (100, 102) in order to control a depressurization of a tank (12), C. 8 Lines 1-25, a pump (20) pulls fluid from a tank (12), thereby reducing pressure in the tank;

**It would have been obvious to one having ordinary skill in the art of pumping systems to control the amount of fluid being removed from a tank as taught by Brigham, in order to control system pressures in a system such as the one taught by Hughes. Controlling pressures will improve efficiency in a system.**

Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hughes et al (US PGPUB No. 2002/0083719 A1) in view of Horak (US Patent No. 3,960,295).

Hughes teaches and discloses of the pump system of claim 11.

Hughes does not teach a system having two tanks, but Horak does.

Horak teaches:

limitations from claim 15, a fluid system having two tanks, wherein when one tank is being used, the other is being filled, C. 2 Lines 48-54;

**It would have been obvious to one having ordinary skill in the art of pumping systems at the time of the invention to provide the fluid system taught by Hughes with a two tank system as taught by Horak in order to provide continuous pumping, reducing loss of production time, C. 1 Lines 39-41 of Horak;**

Claims 11, 16, 17 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Brigham (US Patent No. 4,662,181) in view of Drube et al (US PGPub No. 2003/0126867).

Brigham teaches:

From claim 11:

a cryogenic pumping system, **FIG. 2**, comprising a cryogenic fluid tank, **FIG. 2 (10) C. 8 Line 38**, a cryogenic pump having an inlet pressure drop, **FIG. 2 (28, 30) C. 8 Lines 32-38**, and a suction line, **FIG. 2 (16, 26)**, connecting the tank **(10)** to the pump **(30)**;

Brigham does not teach a means for controlling both a pressurizing and depressurizing means, but Drube does.

Drube teaches:

From claim 11:

a pressurizing, **FIG. 1A (26)**, and depressurizing means **FIG. 1A (62)**, being controlled, **Page 2 ¶ 32**, to change a pressure in a tank, **FIG. 1A (10)**;

**It would have been obvious to one having ordinary skill in the art of pumping systems at the time of the invention to combine the pressure monitoring system taught by Drube with the pumping system taught by Brigham in order to satisfy the pressure needs of a pump. C. 1 Lines 23-31 of Brigham provide motivation.**

Brigham and Drube teach and disclose of the pumping system of claim 11.

Brigham further teaches:

limitations from claims 16, 17 and 18, wherein a tank **(10)** is filled with a low density fluid and its vapor, such as hydrogen or helium, **C. 6 Lines 1-8**;



Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Brigham (US Patent No. 4,662,181) in view of Drube et al (US PG PUB No. 2003/0126867) as applied to claim 11 above, and in further view of Horak (US Patent No. 3,960,295).

Brigham and Drube teach and disclose of the pumping system of claim 11.

Neither Brigham nor Drube teach a system having two tanks, but Horak does.

Horak teaches:

limitations from claim 15, a fluid system having two tanks, wherein when one tank is being used, the other is being filled, **C. 2 Lines 48-54**;

**It would have been obvious to one having ordinary skill in the art of pumping systems at the time of the invention to provide the fluid system taught by Brigham as modified by Drube with a two tank system as taught by Horak in order to provide continuous pumping, reducing loss of production time, C. 1 Lines 39-41;**

Claims 12, 13 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Brigham (US Patent No. 4,662,181) in view of Drube et al (US PG PUB No. 2003/0126867) as applied to claims 11, 16, 17 and 18 above, and in further view of Boissin (EP 0010464 A).

Drube teaches controlling the pressure of a tank **(10)** based on signals from a pressure sensor, **Page 2 ¶ 32**.

Neither Brigham nor Drube teach a temperature sensor, but Boissin does.

Boissin teaches:

limitations from claim 12 and 14, temperature, **FIG. 1 (22) Page 4 bottom paragraph**, and pressure sensors, **FIG. 1 (21) Page 4 bottom paragraph**, in a control line, **FIG. 1 (3) Page 4 bottom paragraph**; wherein the pressure and temperature values are use to determine a NPSH, **Page 4 bottom paragraph**, ;

**It would have been obvious to one having ordinary skill in the art of pumping systems at the time of the invention to use the pressure calculating method taught by Boissin with the pumping and pressure regulating system taught by Brigham and modified by Drube in order to more accurately supply a pump with fluid. Thereby avoiding cavitation and pump damage.**

Brigham, Drube and Boissin teach and disclose of the pump system in claims 11 and 12.

Drube further teaches:

limitations from claim 13, wherein said pressurization and depressurization control means comprise a tank pressurizing valve (26) and a tank depressurizing valve (62);

### ***Conclusion***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to CHRISTOPHER BOBISH whose telephone number is (571)270-5289. The examiner can normally be reached on Monday through Thursday, 7:30 - 6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Devon Kramer can be reached on (571)272-7118. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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